

Docket No. F-7266

Ser. No. 10/033,434

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently amended) A method for layered structure breaking strength estimation, comprising:

inserting an edge of a cutting blade into an upper layer of the structure,

moving the cutting blade substantially in parallel with an interface between the upper layer and a lower layer of the structure while automatically controlling a depth of the cutting blade to a depth slightly higher than the interface,
the step of moving the cutting blade while automatically controlling the depth of the cutting blade comprises mounting the cutting blade on a longitudinal slide way, moving the longitudinal slide way in a direction vertical to the interface by means of a longitudinal ball screw and coupling a motor to the longitudinal ball screw to enable automatic control of the movement of the cutting blade in the direction vertical to the interface and thus the depth of the cutting blade, and

measuring a force exerted on the cutting blade substantially in parallel with the interface.

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2. (Previously cancelled)

3. (Previously presented) A method for layered structure breaking strength estimation according to claim 1, wherein the force exerted on the cutting blade substantially in parallel with the interface, a force exerted on the cutting blade substantially vertical to the interface, and the depth of the cutting blade are expressed in the form of a graphic profile of change with time.

4. (Previously presented) A method for layered structure breaking strength estimation according to claim 1 or 3, wherein the depth of the cutting blade is automatically controlled to increase or decrease by a unit of displacement not greater than 2 micrometer.

5. (Currently amended) A layered structure breaking strength estimation apparatus comprising:

a cutting blade,

inserting means for inserting an edge of the cutting blade into an upper layer of the structure,

moving means for moving the cutting blade substantially in parallel with an interface between the upper layer and a lower layer of the structure,

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control means for automatically controlling a depth of the cutting blade to a depth slightly higher than the interface, said control means comprise a longitudinal slide way on which the cutting blade is mounted, a longitudinal ball screw arranged to move the longitudinal slide way in a direction vertical to the interface, and a motor coupled to the longitudinal ball screw to enable automatic control of the movement of the cutting blade in the direction vertical to the interface and thus the depth of the cutting blade, and

measuring means for measuring a force exerted on the cutting blade substantially in parallel with the interface.

6. (Previously Cancelled)

7. (Previously presented) A layered structure breaking strength estimation apparatus according to claim 5, further comprising graphic means for expressing the force exerted on the cutting blade substantially in parallel with the interface, a force exerted on the cutting blade substantially vertical to the interface and the depth of the cutting blade in the form of a graphic profile of change with time.

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8. (Previously presented) A layered structure breaking strength estimation apparatus according to claim 5 or 7, wherein the depth of the cutting blade is automatically controlled to increase or decrease by a unit of displacement not greater than 2 micrometer.

9. (Previously presented) A method for layered structure breaking strength estimation according to claim 1, wherein the cutting blade is moved while automatically controlling the depth of the cutting blade to be constant.

10. (Previously presented) A method for layered structure breaking strength estimation according to claim 1, further comprising measuring a variable force exerted on the cutting blade substantially vertical to the interface while maintaining the cutting depth constant.

11. (Previously presented) A method for layered structure breaking strength estimation according to claim 1, further comprising arranging a first motor to move the cutting blade in a direction parallel to the interface and arranging a second motor separate from the first motor to move the cutting blade in a direction vertical or perpendicular to the interface.

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12. (Cancelled).

13. (Currently amended) A method for layered structure breaking strength estimation according to claim 1 [[12]], further comprising adjusting the depth of the cutting blade by controlling the motor to actuate the longitudinal ball screw.

14. (Previously presented) A layered structure breaking strength estimation apparatus according to claim 5, wherein the cutting blade is moved by the moving means while the depth of the cutting blade is automatically controlled to be constant by the control means.

15. (Previously presented) A layered structure breaking strength estimation apparatus according to claim 5, further comprising measuring means for measuring a variable force exerted on the cutting blade substantially vertical to the interface while the cutting depth is maintained constant by the control means.

16. (Previously presented) A layered structure breaking strength estimation apparatus according to claim 5, further comprising a first motor arranged to move the cutting blade in a direction parallel to the interface, and a

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second motor separate from the first motor arranged to move the cutting blade in a direction vertical or perpendicular to the interface.

17. (Cancelled)

18. (Currently amended) A layered structure breaking strength estimation apparatus according to claim 5 [[17]], wherein the motor is controlled to actuate the longitudinal ball screw and thereby adjust the depth of the cutting blade.